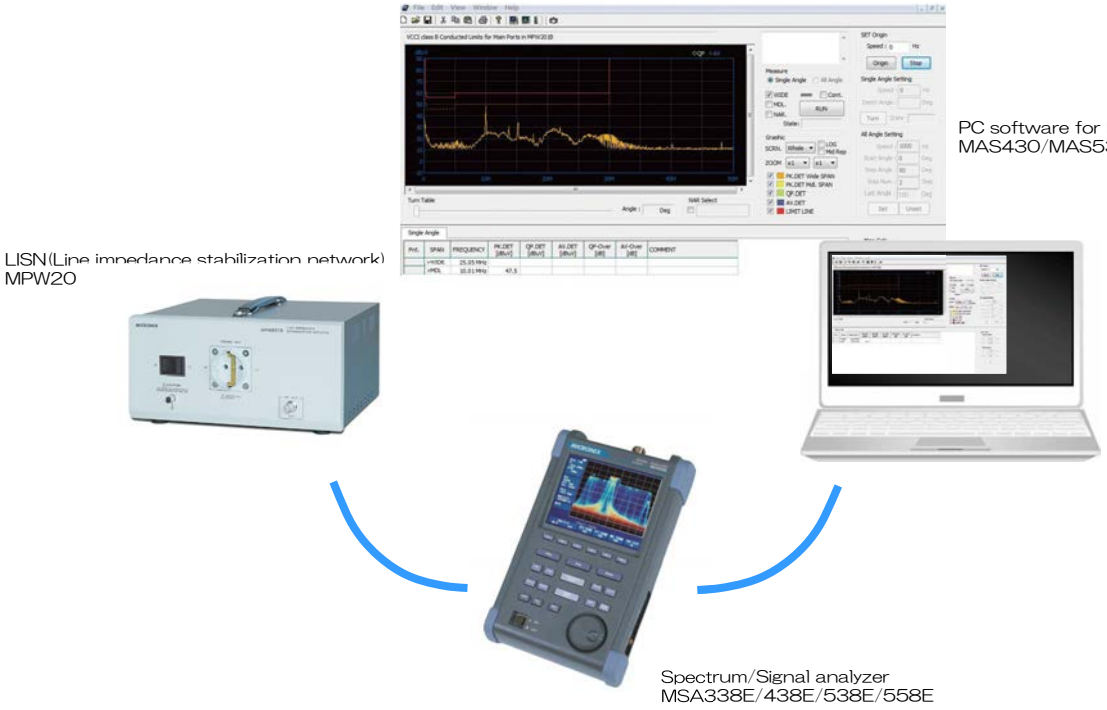
C & U
CREATIVE & UNIQUE

MICROWAVE

Conducted EMI Test System

MR2150

MR2150 is a precompliance test system for conducted EMI.
The development cost can be significantly reduced by debugging and evaluating EUT using this system before testing in the formal EMC site.



PC software for EMI
MAS430/MAS530

LISN(Line impedance stabilization network)
MPW20

Spectrum/Signal analyzer
MSA338E/438E/538E/558E

Features

●Precompliance test system with superior cost performance

Operating stability and usability of this system are fully confirmed because all of components consisting of spectrum/signal analyzer, LISN and PC software have been developed by ourselves.
Additionally, each price of those pieces is very reasonable. EMI test environment with superior cost performance is offered.

●Handheld spectrum/signal analyzer MSA series with good reputation since 2002

Spectrum/signal analyzer can be selected from among MSA438E with sweep system and MSA538E/558E with real time plus sweep system, according on budgets and performance/function.

●High efficiency EMI test by rich software functions

PC software for EMI can correct insertion loss of LISN and cable. Also, in the auto-sequence mode, PK(peak) over specified level is picked up in wide band and then QP(quasi peak) and AV(average) of chosen spectra are precisely measured in narrow band. Therefore, the mesuring time is greatly shortened.

●The most inexpensive LISN with good portability

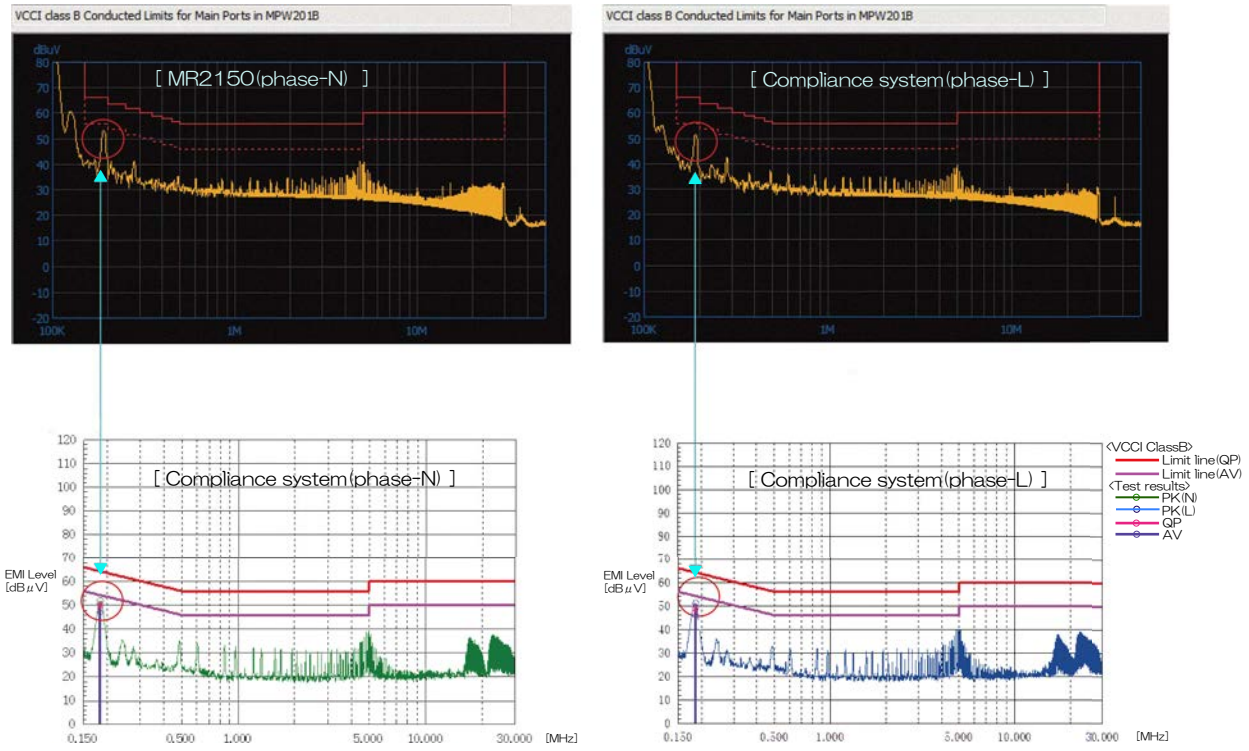
Our LISN is the most inexpensive although it is equipped with a built-in transient limiter and is more portable, compact and lightweight than others. Good portability of the LISN and MSA series provides better EMI test environment in a limited space.

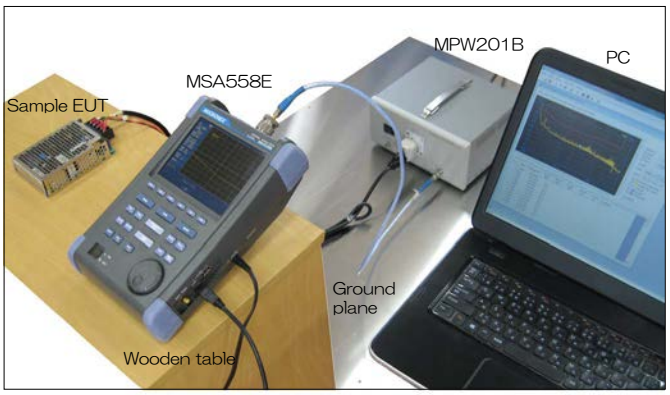
Test example

●EMI test example of a sample EUT (switching power supply)

The test results of MR2150(MSA558E, MPW201B) in a non-shielded laboratory and a compliance system at a formal EMC site are shown below. The differences of QP and AV at the noise peak between the two systems are only within ±3 dB or ±4 dB as shown in figures. Therefore, finding the source of noise and solving the problems using MR2150 before formal test will reduce the total EMI test cost.

[Comparison between test results of MR2150 and a compliance system]





[MR2150 test scene(image)]

Specifications

●System

Items	MR2150 ※1
Frequency range	150kHz~30MHz
Standards supported ※2	CISPR11 (classA/B,group1), CISPR22 (classA/B), EN55011 (classA/B,group1), EN55022 (classA/B), VCCI (classA/B), FCCpart15 subpartB (classA/B)

※1 This system consists of a part relating to conducted emission measurement in EMI total test system MR2300.
※2 Even standard not existing in above table is available by inputting the limit line information in the format of the PC software.

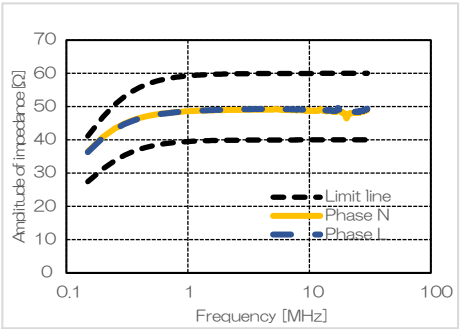
●Spectrum/Signal analyzer

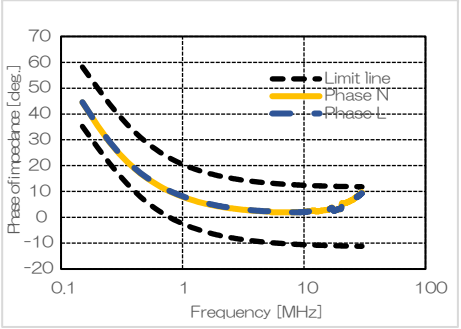
Items	MSA438E	MSA538E	MSA558E
Frequency range	50 kHz to 3.3 GHz	20 kHz to 3.3 GHz	20 kHz to 8.5 GHz (558E)
Center frequency setting resolution	20 kHz	100 Hz	100 Hz
Frequency span	0 Hz (zero span), 200 kHz to 2 GHz (1-2-5 step) and 3.3 GHz (full span)	Sweep mode :0 Hz (zero span), 100 kHz to 2 GHz (1-2-5 step) and 3.3 GHz (full span) Real time mode:20 kHz to 20 MHz (1-2-5 step)	Sweep mode :0 Hz (zero span), 100 kHz to 5 GHz (1-2-5 step) and 8.5 GHz (full span) Real time mode:20 kHz to 20 MHz (1-2-5 step)
Resolution bandwidth (3 dB)	3 kHz,30 kHz,300 kHz,3 MHz and AUTO	300 Hz to 3 MHz (1-3 step) and AUTO	300 Hz to 3 MHz (1-3 step) and AUTO
Resolution bandwidth for EMI (6 dB)	9 kHz, 120 kHz, 1 MHz	9 kHz, 120 kHz, 1 MHz	9 kHz, 120 kHz, 1 MHz
Resolution bandwidth selectivity	1:12 (typ) @3 dB:60 dB	1:4.5 (typ) @3 dB:60 dB	1:4.5 (typ) @3 dB:60 dB
Video bandwidth	100 Hz to 1 MHz (1-3 step) and AUTO	100 Hz to 3 MHz (1-3 step) and AUTO	100 Hz to 3 MHz (1-3 step) and AUTO
Average noise level (@1 GHz)	-162 dBm/Hz (typ)	-162 dBm/Hz (typ)	-157 dBm/Hz (typ)
Amplitude display dynamic range	10 div/100 dB	10 div/100 dB	10 div/100 dB
Display scale	2, 5, 10 dB/div	2, 5, 10 dB/div	2, 5, 10 dB/div
RF input connector	N (J)	N (J)	N (J)
Sweep time	10 ms to 30 s (1-3 step) and AUTO	10 ms to 30 s (1-3 step) and AUTO	10 ms to 30 s (1-3 step) and AUTO
External trigger	Available	Available	Available
EMI detection mode	PosPK (positive peak), QP (quasi peak) and AV (average)	PosPK (positive peak), QP (quasi peak) and AV (average)	PosPK (positive peak), QP (quasi peak) and AV (average)
LCD	5.7 inches and color 640 (H) x 480 (V) dots	5.7 inches and color 640 (H) x 480 (V) dots	5.7 inches and color 640 (H) x 480 (V) dots
Display dots	501 (H) x 381 (V)	501 (H) x 381 (V)	501 (H) x 381 (V)
Battery operation time/ remainder indication	4 hours/5 level indication	4 hours/5 level indication	4 hours/5 level indication
Communication interface	Corresponds to USB2.0	Corresponds to USB2.0	Corresponds to USB2.0
USB memory	Uses A plug (host), and stores spectrum waveform, setting parameters and spectrum data + setting parameters.	Uses A plug (host), and stores spectrum waveform, setting parameters and spectrum data + setting parameters.	Uses A plug (host), and stores spectrum waveform, setting parameters and spectrum data + setting parameters.
Dimensions	162 (W) x 71 (H) x 265 (D) mm (excluding projections, protection bumper and stand)	162 (W) x 71 (H) x 265 (D) mm (excluding projections, protection bumper and stand)	162 (W) x 71 (H) x 265 (D) mm (excluding projections, protection bumper and stand)
Weight	approx. 1.8 kg (including battery)	approx. 1.8 kg (including battery)	approx. 1.8 kg (including battery)

●LISN (Line impedance stabilization network)

Items	MPW201B
Frequency range	150 kHz to 30 MHz
Circuit type	50Ω/50μH and V type based on CISPR16-1
Impedance accuracy	within ±20% in amplitude, and ±11.5° in phase
Number of phase	Single
Max. power supply voltage	250 VAC
Rated current	15 A
Power supply frequency	50/60 Hz
RF connector	BNC female
Transient limiter	Built-in
Dimensions	260 (W) ×125 (H) ×220 (D) mm (excluding projections)
Weight	approx. 2.3 kg

[Reference]
The impedance of power supply line affects a measured noise value on the line, but LISN inserted between EUT and power supply line keeps the impedance observed from EUT constant. However, EUT port impedance of LISN is defined in CISPR 16-1, as within ±20% (±10Ω) in amplitude and ±11.5° in phase. The impedance of MPW201B meets the standard as shown in right figure.





Selection guide

●Spectrum/Signal analyzer and PC software for EMI

Product	MSA438E	MSA538E	MSA558E
PC software for EMI	MAS430	MAS530	MAS530
Standard accessories			
BNC(P)/SMA(P) adaptor	○	○	○
SMA(P)/SMA(P) cable	○	○	○
SMA(J)/SMA(J) high pass filter	○	○	○
SMA(J)/N(P) adaptor	○	○	○
USB cable	○	○	○

●LISN

Model	AC/DC power supply	Max. voltage	Rated current	Phase number
MPW201B	AC	250 V	15 A	Single
LISN 1 ※	AC/DC	125 V	15 A	Single
LISN 2 ※	AC/DC	440 V	25 A	Single/Three
LISN 3 ※	AC/DC	440 V	100 A	Single/Three
LISN 4 ※	AC/DC	440 V	200 A	Single/Three
LISN 5 ※	AC/DC	440 V	300 A	Single/Three

※ Contact us for more informations. Portability and specifications about transient limiter are defferent in each model.

●Options

[Leakage prevention/Stabilization of power supply] Possible to prevent leakage and to simulate power supply fluctuation.

Product	Usage	Output capacity	Phase number ※
Noise-cut transformer	Leakage prevention	1.5 kVA	Single (2-wires)
Programmable power supply	Simulation of power supply fluctuation (including leakage prevention)	1 kVA	Single (2-wires)
Programmable power supply	Simulation of power supply fluctuation (including leakage prevention)	2 kVA	Single (2-wires)

※ Contact us for single(3-wires) and three phase.

[Test environment] CISPR claims the specified distance between EUTand a ground plane.

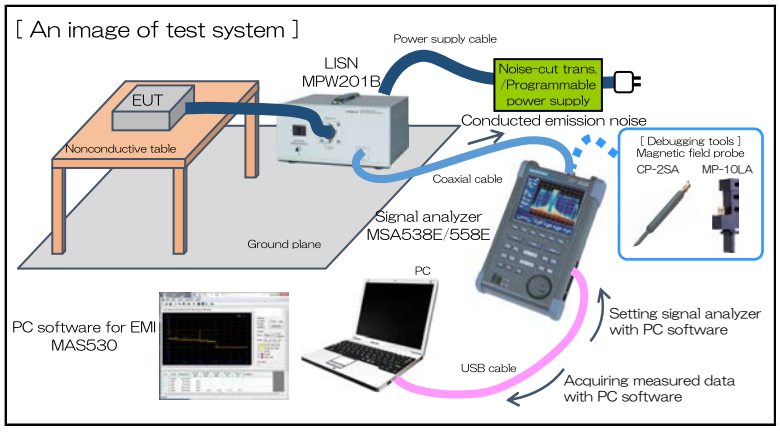
Product	Model	Size	Meterial
Ground plane	Custom-made ※	2 m x 2 m(standard)	Aluminum(A5052P-H34)
Nonconductive table	Custom-made ※	0.4 m in height(standard)	Wood

※ Contact us for more informations.

[Debugging tools] Possible to find noise source and propagation pass by connecting to spectrum/signal analyzer.

Product	Model	Frequency range	Standard accessories
Magnetic field probe	CP-2SA	10 MHz to 3 GHz	Adaptor、Cable ※
Magnetic field probe	MP-10LA	150 kHz to 1 GHz	Adaptor、Cable ※

※ Adaptor(CP-2SA) : SMA(J)/SMA(J)×1 and L-type SMA(P)/SMA(J)×1、Adaptor(MP-10LA) : L-type SMA(P)/SMA(J)×1、
Cable : SMA(P)/N(P)×1



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